Ghost Window Animation Region

Lift

V-Stretch

Facing Page

Turning Page

Revealing Page

H-Stretch

FIG 1

FIG 2

Animation Frame Buffers
(Used in one half-turn)

Source buffer for upturn/downturn page plus the area above and below the page that need restoring

Source buffer for the Revealing Page. The whole double page needs to be created to allow for page layouts where text or images bleed across the gutter between pages.

Double buffer for painting all the animation elements before sending a complete frame to the screen

Screen buffer or Ghost Window. This is visible during the page-turn sequence and receives a complete frame from the double-buffer

Inter Web Curtains

Sams Teach Yourself
e-Baseball Today

FIG 3

Ghost Window

Part I: Stepping Up to the Plate

Intel WebOutfitter

Sams Teach Yourself
e-Baseball Today

Macmillan USA

A Virtual Publication
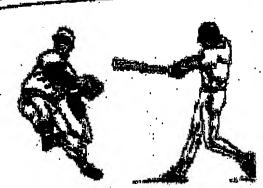
Created by The Virtual Publishing Company, April 2000

23

FIG 4

Chapter 1: Learning the Rules Online

The Rules of American Legion Baseball

American Legion baseball was first played in 1925. High-school age players from across the nation play American Legion baseball, typically during the summer after their high school season has ended. According to American Legion, nearly 85,000 players participated in the program in 1999. Players are age 15-18, and a local American Legion Post sponsors their teams. There are other programs for this and other age levels to Legion play--Amateur Athletic Union (AAU), Babe Ruth, Connie Mack, Mickey Mantle, Little League (covered later in this chapter), and PONY Baseball, just to name a few. Each has its own set of official rules. Let's use American Legion as an example, since it is the largest baseball program for high-school aged kids. The American Legion baseball site itself is not very pretty to look at, but it's chock full of information. You can find it at www.legion.org.

Click Here to visit The American Legion Web Site
www.legion.org/BASEBALL/index.htm

By the Way:

American Legion baseball is a program of the American Legion, the national association for veterans of military service. As such, the American Legion baseball Web site is really part of a larger site for the American Legion itself.

12

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FIG 5

The Rules of American Legion Baseball

Chapter 3: Learning Baseball Online

American Legion baseball was first played in 1925. High-school age players from across the nation play American Legion baseball, typically during the summer after their high school teams' seasons have ended. According to the American Legion, nearly 95,000 players participated in the program in 1999. Players are age 15-18, and a local American Legion Post sponsors their teams. There are other programs for this and other age levels to

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Click Here to visit The American Legion Web Site
www.legion.org/baseball/index.htm

By the Way:

American Legion baseball is a program of the American Legion, a national organization for veterans of military service. As such, the American Legion baseball site is largely a tribute site for the American Legion itself.

American military site is

12

13

13

FIG 6

Chapter 1: Lesson...

The Rules of Americ... Legion Baseball

American Legion baseball was first played in 1925. High-school age players from across the nation play American Legion baseball, typically during the summer after their high school teams' seasons have ended. According to the American Legion, nearly 85,000 players participated in the program in 1999. Players are age 15-18, and a local American Legion Post sponsors their teams. There are other programs for this and other age levels, too...

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Click Here to visit The American Legion Web Site
www.legion.org/...

By the Way.

...program of the American ...veterans of military ...baseball Web site is ...rican Legion itself.

12   13   13

FIG 7

Chapter 13 Learning

The Rules of Ameri... Baseball

Baseball

12

13

19

FIG 8

The Rules of Ameri~~~ Legion Baseball

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Click Here to visit The American Legion Web Site
www.legion.org/~~~~~~~~~~~/home.htm

By the Way:

~~~ Legion baseball is a program of the American ~~~ the national association for veterans of military ~~~ as such, the American Legion baseball Web site is ~~~ part of a larger site for the American Legion itself.

12

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FIG 9

User initiates a page-turn.

↓

Lay out requested page to a buffer and update page number.

↓

Display ghost overlay window.

↓

Record exact time.

↓

Prepare 'upturn' buffer as duplicate of one half ghost window

↓

FRAME OUTPUT

↓

MEASURE ELAPSED TIME AND PRODUCE NEXT FRAME.

↓

REPEAT UNTIL UPTURN ANIMATION TIME ELAPSED.

↓

AT COMPLETION OF UPTURN CREATE DOWNTURN BUFFER AND REPEAT PROCESS IN REVERSE.

↓

Downturn buffer does not need revealing page

↓

At completion buffer of last frame repaint actual window and lose ghost window

Fig. 10

FRAME OUTPUT

Measure elapsed time

↓

Get Frame Width based on 'curved' time

↓

PRECALCULATE HORIZONTAL / VERTICAL PIXEL MOVEMENT

↓

Break page into two representing two quadrants of double page

↓

Identify midpoint pixel row for both source and destination (start of quadrant)

↓

UPDATE PIXEL ROWS TO DUPLICATE GHOST BUFFER

↓

PAINT REVEALING PAGE

↓

SEND GHOST DUPLICATE BUFFER FOR SCREEN PAINTING

↓

OPERATING SYSTEM UPDATES FRAME TO SCREEN

Fig. 11

PRECALCULATE HORIZONTAL / VERTICAL PIXEL MOVEMENT

For each destination pixel calculate the elliptic projection of curved (turning page) line from flat line

↓

Calculate Beginning / End boundaries of 'row' source pixels for each 'row' destination

↓

Factor Source pixel values down to value of one destination pixel

↓

Store Source: Destination pixel ratio in memory for one complete row

↓

Calculate vertical movement of pixels for each column

↓

Store vertical pixel movement in memory for one complete row

Fig. 12

UPDATE PIXEL ROWS TO DUPLICATE GHOST BUFFER

Traverse all destination pixels by row

↓

For each pixel get memory look-up of source boundaries and dest / source ratios

↓

Read source pixels values, break out red, green and blue values

↓

Aggregate values, factor down to destination pixel and remix colours

↓

Look up vertical pixel movement and store running total.

↓

Write pixel destination

↓

Repeat process for each row of pixels

↓

Complete all pixels in quadrant

↓

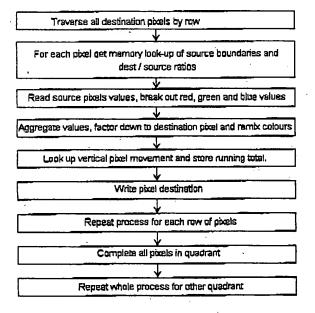Repeat whole process for other quadrant

Fig. 13

PAINT REVEALING PAGE

From laid out page calculate number of pixels in each row to be revealed

Update pixels row by row for revealing page

Fig.14

SEND GHOST DUPLICATE BUFFER FOR SCREEN PAINTING

Place updated buffer in messaging queue for next repaint by operating system

Request first priority for repaint to operating system

Fig. 15